COURSE DESCRIPTION CARD - SYLLABUS

Course name
Robotics [N1MiBM1>ROB]

Course

Field of study
Mechanical Engineering

Year/Semester
3/6

Area of study (specialization)
–

Profile of study
general academic

Level of study
first-cycle

Course offered in
polish

Form of study
part-time

Requirements
compulsory

Number of hours

Lecture
12

Laboratory classes
8

Other (e.g. online)
0

Tutorials
0

Projects/seminars
0

Number of credit points

2,00

Coordinators

Lecturers

Prerequisites

The student should have knowledge of physics, mechanics and technology at the secondary technical level. He should have the ability to solve elementary problems in the field of building control algorithms (programming rules) and designing processes based on his knowledge and the ability to obtain information from the indicated sources.

Course objective

Providing students with theoretical and practical issues, issues related to the construction, programming and application of robots in the scope specified by the program content appropriate for the field of study. Developing in students problem solving and problem solving and the analysis of results in solutions for obtaining knowledge. Shaping teamwork in students.

Course-related learning outcomes

Knowledge:
The student is able to:
Identify, describe and explain the principle of operation of the main components of the manipulator and the industrial control system, together with the meaning and role of the main instructions.
Select programming instructions for RP working machines (RP learning) in the field of programming of initial and final conditions.

Identify and describe the issues (problems) of operation and diagnostics of industrial robots, including their life cycle.

Skills:
The student can:
Identify a technical problem, determine its degree of complexity, and then propose a solution that takes into account the final goal (effect).
Develop algorithms and control programs for industrial robots cooperating in the field of manipulation activities and conduct tests of the control program taking into account the conditions.

Social competences:
The student is able to:
Actively engage in solving the problems posed, independently develop and expand their competences, and cooperate in a team.
Properly define the priorities for the implementation of the task set by yourself or others.
Be entrepreneurial and creative (innovative).

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Learning outcomes presented above are verified as follows:
The knowledge acquired during the course is verified on the test. It consists of 5 open-ended questions and one computational task with different scores. Passing threshold: 50%. The knowledge acquired during laboratory classes is verified on the basis of an oral or written answer regarding the content of each laboratory exercise performed, a report on each laboratory exercise according to the guidelines set out in the guide to exercises and indications of the laboratory teacher. In order to pass the laboratories, all exercises must be passed (positive grade from answers and reports).

Programme content

Lecture:
Basic concepts: definition, classification and application of robots; Construction of robots and manipulators (drive systems, drive transmission and control); Kinematic chains (open, closed, planar and three-dimensional, series and parallel, designation, kinematic pairs, number of degrees of freedom and mobility); Coordinate systems; Work spaces; Simple and reverse transformation; Basics of programming industrial robots; Basic equipment for industrial robots (grippers, technological heads, external sensors); Health and safety conditions when working with industrial robots.
Lab
Practical exercises in the field of principles and methods of programming educational and industrial robots.

Teaching methods

Lecture: multimedia presentation illustrated with examples given on the board.
Laboratory exercises: performing experiments, solving problems, discussion, team work, programming.

Bibliography

Basic
1. Kost G., Łebkowski P., Węsierski Ł., Automatyzacja i robotyzacja procesów produkcyjnych, PWE, 2014
2. Żurek J., Podstawy Robotyzacji - Laboratorium., WPP, Poznań, 2006
3. Zdanowicz R. Robotyzacja dyskretnych procesów produkcyjnych, WPŚ, Gliwice, 2011
4. Podręczniki programowania robotów, ABB, Fanuc, Panasonic
Additional

Breakdown of average student's workload

	Hours	ECTS
Total workload	40	2,00
Classes requiring direct contact with the teacher	20	1,00
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	20	1,00